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ABSTRACT

Structural reorganization was investigated as one factor associated with the development of the University of New Mexico from an undergraduate teaching institution toward becoming of a nationally-ranked graduate research university. A longitudinal, ethnohistorical study was undertaken for the 1967-1978 period. The qualitative research methodology involved an extensive review of institutional documents and informal interviews with key university administrators. Attention was directed to the university's modification of its organizational structure as an adaptive response to changes in its environment that placed increasing emphasis on campus research as a measure of institutional stature. The creation of the Office of the Vice President for Research further differentiated the institution's organizational structure to strategically focus on the university's research support environment; the structure was modified to focus specifically on encouraging and supporting faculty research. Two theoretical propositions are suggested, based on structural reorganization resulting from external pressures. The development of grounded theory in general is addressed, as well as the relationship between the federal government and the university research community. (Author/SW)

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THE IMPLICATIONS OF STRUCTURAL REORGANIZATION IN AN EMERGING RESEARCH INSTITUTION

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Invited Symposium
Environmental Change: Implications
for Emerging Research Universities

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ABSTRACT

THE IMPLICATIONS OF STRUCTURAL REORGANIZATION
IN AN EMERGING RESEARCH UNIVERSITY

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Structural reorganization, as a factor associated with the development of the University of New Mexico from an undergraduate teaching institution toward a nationally-ranked graduate research university, was identified in this longitudinal, 1967-1978, ethnohistorical study. The qualitative research methodology employed in this study included an extensive review of official institutional documents and informal interviews with key University administrators. This institutional study examines the University's modification of its organizational structure as an adaptive response to changes in its environment which placed increasing emphasis on campus research as a measure of institutional stature. The creation of the Office of the Vice President for Research further differentiated the institution's organizational structure to strategically focus on the University's research support environment. The findings suggest that structural reorganization enabled institutional leaders to adapt to environmental change and was associated with the University's emergence as a nationally-ranked research institution.

Preface

The invited symposium: Environmental Change: Implications for Emerging Research Universities is composed of four papers entitled: (1) "The Implications of Structural Reorganization in an Emerging Research Institution," (2) "Cognitive Imaging and Organizational Change: The Social Dynamics of an Emerging Research University," (3) "Inter-organizational Cooperation in a Competitive Research Environment," and (4) "Environmental Uncertainty and External Resource Acquisition: Implications for a Developing Research University." These papers are based on the findings of one research effort directed toward investigating how an institution of higher education responded to changes in its research environment and developed from a teaching institution toward a nationally ranked graduate research university. These papers were prepared specifically to analyze distinct factors associated with institutional research development and, as such, to stand as critical and independent works. In consideration that these papers were based on the same research, sections of these papers and some of the data included in the descriptive narratives that impinged on the manner in which the institution responded to events, are the same. The symposium format provides an appropriate forum not only to discuss these factors but to synthesize the propositions in an effort to present a limited but grounded theory of developing research universities.

Introduction

The principal objective of this study has been to discover, examine, and explain structural reorganization as an adaptive response to external environmental change and one factor associated with the development of the University of New Mexico from an undergraduate teaching institution in the direction of a nationally-ranked graduate research university. The University of New Mexico was selected as the unit of study because it was representative of a group of Rocky Mountain and High Plains universities that appeared to be engaged in similar developmental activities during a period of uncertainty about the federal government's commitment to university research support and provided a unique opportunity to study institutional development.

The data bearing on institutional development are briefly reported for two separate, sequential time periods. The descriptive narrative covers the internal modification of the of the organizational structure of this university, including the establishment of the Office of the Vice President for Research. Such adjustments also facilitated the University's attempts to pursue its research agenda and to secure external research support. These organizational development activities were associated with the University's emergence as a nationally-ranked research institution.

Methodology

The dynamic process through which an institution of higher education responds to change in its external environment and develops

from an undergraduate teaching institution to a graduate research university is not well understood. The literature on institutional adaptation to external environmental change is essentially atheoretical in nature and contains little work designed to test theories describing the dynamics of the change process (Giaquinta, 1973, p. 178).

This study is directed toward developing a set of naturalistic generalizations and building theory rather than toward affirming a prevailing theory. The significance of discovering theory from data, the generation of "grounded theory" (Glaser and Strauss, 1967), lies in the researcher's ability to arrive at relevant "predictions, explanations, interpretations and applications" (p. 1) that are both empirically sound and singularly pertinent to the phenomenon under study.

This study focuses on a highly particular slice of the University's environment rather than comprehensively describing and analyzing an institution's responses to changes in its macro environment. It is limited to the University's research environment and presents only a piece of that larger story.

Rationale

The choice of research methodology was determined by the nature of the problem under investigation (Lofland, 1971; Schumacher, 1972). This study employed a methodology that recognized that the relationships and events experienced by participants occurring over time should be examined comprehensively and in their natural setting. Filsted (1979) has noted that an important characteristic of qualitative methodology allows the researcher to get close to the data, obtain first-hand knowledge and develop the "analytical, con-

ceptual, and categorical components of explanation from the data itself" (p. 33). Reality, meaning, and behavior were analyzed from the perspective of the subjects' interpretation of the world. Attention to the subjects' perspective allowed the researcher to obtain a rich contextual understanding of events and to obtain a powerful way to understand the phenomenon of cognitive imaging in organizational change. A field study approach provided a flexible means through which a university's structural reorganization efforts could be examined comprehensively (Babbie, 1979) and in context.

Data Collection

In utilizing qualitative research methodology for the study of organizations, it is important to employ a wide variety of data collection techniques to ensure the flexibility necessary to gathering relevant data (Glaser and Strauss, 1967) and to assuring the validity and reliability of the data. The nature of the phenomenon under study lent itself to using the ethnohistorical approach described by Schumacher (1972) and Smith (1978). This approach focuses on "the accumulation of evidence about events in the past and their subsequent interpretation by the participants as part of a larger phenomenon (Higbie, 1981, p. 47). The ethnohistorian attempts to go beyond the official description of events and to include personal recollections, anecdotes, and quotations in an attempt to develop a vivid, provocatively-rich account of events. To accomplish this goal, a combination of qualitative research techniques commonly associated with the participant-observation approach (McCall and Simmons, 1969) was employed. By analyzing documents such as memoranda, desk logs, letters, written reports, minutes of board meetings, proposals,

journal articles, newspaper accounts and press releases, explicit knowledge was obtained and organized into a longitudinal historical record that chronicled events during the "bounded" (Stake, 1978, p. 7) period of time, 1967-1978, during which the University of New Mexico moved in the direction of a graduate research university. These documents collected from the "official files" of the University of New Mexico and from the personal files of participants proved to be a valuable source of information that provided the researcher with an additional avenue by which to observe how individuals reacted to external events and initiated actions inside the organization. Through informal interviews, the researcher obtained additional, explicit information and "tacit knowledge" (Polyani, 1958) about those pre-verbal understandings of events pertinent to the research effort.

Through this approach, which is described by Smith and Pohland (1972) as a "multi-method, multi-person, multi-situation, multi-variable matrix (p. 11), opportunities became available to follow Iannaccone's (1975) "reiterative cycle" of definition, data collection, analysis and examination of concepts, and subsequent redefinition, as need emerged from the data, generated by this "disciplined inquiry" (Cronbach and Suppes, 1969).

In most qualitative studies, it is common practice to mask the identity of persons and places when developing the descriptive narrative. Rist (1982) notes that masking "becomes difficult as too much data is supplied" (p. 10) about people, events and places. Moreover, a substantial amount of information concerning the background and setting of the study is customarily provided in a credible ethno-

graphic study which would enable a determined individual to identify the research location. The University of New Mexico's involvement in the establishment of a Consortium of Rocky Mountain and High Plains universities, the Western Regional Scientific Laboratory, Inc., and its attempt to manage the Los Alamos Scientific Laboratory, all of which are described and analyzed in this study, are unique. For all these reasons it was decided, therefore, to retain the identities of persons, places and events with the provisions that the researcher provide the individuals that participated the opportunity to review and comment on the draft of the descriptive narrative in which their names appeared and in which they were quoted. This process of review and comment by the participants also contributed to the study's validity.

Data Analysis

An effort was made to correlate and analyze the data during the collection phase of this study. Categories developed as a result of preliminary studies were coded and examined for a "goodness of fit" (McCall and Simmons, 1969, p. 233), with new data emerging from interviews and documents during the last seven months of the study. These categories were refined through constant comparison (Glaser and Strauss, 1967) between the original definitions and the emerging data.

The process of data collection and analysis was refined, focused and directed through the process of "theoretical sampling" suggested by Glaser and Strauss (1967, p. 45). Preliminary categories were examined and redefined, and new categories and sub-categories were generated and tested throughout the study, and data that supported the emerging concepts were designated. By examining and comparing

the contexts and concepts, probable relationships were formulated and examined. Through this process several concepts emerged that were felt to be most applicable in illuminating the phenomena under study and were substantially accounted for in the data. The emergent concepts were then elaborated and ordered in propositional form.

Generation of Theory

The development of "grounded theory," which attempts to explain how universities develop in the direction of research institutions, was the final outcome of the study. However, the immediate applicability of the theory should be reserved. Grounded theories emerge from limited ranges of data and are limited to contextual ranges of applications. The development of "special theories adequate to limited ranges of social data (rather than)...the search for all-indusive conceptual themes" (Merton, 1957, pp. 9-10) is of paramount importance in this study.

The value of research directed towards developing grounded theory lies not in the validation of existing theory but, rather, in the discovery of new understandings and perceptions. This study does not assert that the grounded theory developed here will reflect the manner in which all institutions adjust to changes in their environment or the manner in which they will develop in the direction of graduate research institutions. Rather, it is based on the premise that "understanding the response of one institution in one setting may contribute to the fundamental and general understanding of how institutions of higher education respond to their environment and pursue development into research organizations" (Bjork, 1983, pp. 179-180). Although the setting changes from one institution to

another, it is suggested that the grounded theoretical framework developed here probably reflects elements that can contribute to a better understanding of how any university interacts with its environment and develops in the direction of a research institution.

Background

The association between science and the federal government is a unique American phenomenon (Veysey, 1963) that has proved to be mutually advantageous: government agencies accomplish their applied research with the assistance of trained university scientists, and the government's support of science provides a source of strength to the emergence of scientific research in institutions of higher education.

Although reliance on colleges and universities for the performance of applied research began on a modest basis during the the latter part of the 19th Century, the pursuit and support of science by the federal government inside universities grew rapidly (Cowley, 1980; Dupree, 1957; Millet, 1952). During the 1930's scholarly and scientific pursuits were recognized as valuable resources in finding solutions to difficult and pressing national economic and social problems. The practice of linking applied science with practical public service developed as a dominant theme in the federal government's rationale for employing and financially supporting university-based research.

The relationship between the federal government and the university research community entered a new era during the 1940's, when both the diversity and scale of research expanded substantially. The federal government accepted the major financial responsibility

for the support of scientific research and for establishing a state of mutual dependence (Ashworth, 1972; Kidd, 1959; Price, 1965) with institutions of higher education. The rapid expansion of federal financial support for university-based research, according to Corson (1975) originated in the years just prior to World War II, when the government sought the assistance of highly-skilled faculty researchers.

During and after World War II, federally-sponsored research rapidly became a major campus activity. Federal grants and contracts became the principle means of providing support for scientific research. Federal support for research rapidly overshadowed university resources as the primary means of funding scholarly research activities (Corson, 1975; Kidd, 1959; Strickland, 1967). An indirect result of this shift in research support from the universities themselves to the federal government shaped the fundamental characteristic of government-university relationships during the post-War period (Dupree, 1957; Murphy, 1971; Orlans, 1968) and enhanced the research capabilities of institutions of higher education. The federal government emerged as the principal sponsor of scientific research, and the universities were recognized as the locus for carrying out government research.

The dramatic increase in federal support for university-based research and development between 1953 and 1968, increasing from $1.25 million to $1.9 billion (Smith and Karlesky, 1977, p. 18) had a profund impact on the evolution of established and developing institutions. The literature suggests that federal support stimulated the growth of campus research, shifted institu-

tional emphasis toward graduate education and research training, shaped the direction of research, dominated its continuance, contributed to the emergence of research as a measure of institutional stature and ushered in a new era of political relations between the universities and the federal government (Babbidge, 1968; Ben-David, 1972; Heimovicks, 1971; Kidd, 1959; Klopsteg, 1959; Price, 1965). As a consequence of this unprecedented and massive support, the shape of research in universities and the direction of research institutions were no longer the concern of the academic community alone but emerged as both a matter of public and institutional attention. The literature suggests that as the external research environment became more dynamic, research universities adapted, some rapidly than others, to the new demands by placing an increased emphasis on research.

Findings

In the years just prior to 1968, when federal support for research and development in the nation peaked, some faculty members and administrators at the University of New Mexico noted the growing national emphasis being placed on research. During the 1967-1968 period the University was characterized as a "young, maturing institution" (personal interview, Travelstead, July 26, 1982) that was in the nascent stages of development as a research institution. The new administration's emphasis on expanding sponsored faculty research was supported by key faculty members and was viewed as an important vehicle through which the quality of instruction, graduate programs and faculty could be improved and as an important vehicle through which the stature of the institution could be enhanced.

During the 1967-1968 period, the University, in moving toward the establishment of the Office of the Vice President for Research, shifted the manner in which it viewed itself internally and the way in which it wanted to be viewed externally. It was a significant shift and a symbolic step in the direction of the maturation of the institution.

The decision to move the institution into the mainstream of academic life by expanding campus research led, in 1967, to the decision to establish the Office of the Vice President for Research. This decision was made by President-elect Heady in consultation with other key administrators and faculty members and was implemented shortly after he became president in 1968.

The Formative Period

The establishment of a more supportive climate for faculty research took several directions: encouraging and facilitating faculty research, providing recognition for research internally and externally, and relieving the burden and diversity of work for which the Academic Vice President was responsible. These were significant goals that held constant during the Administration's discussions on establishing the Office of the Vice President for Research. The Administration and a small group of faculty members actively sought to increase research on campus and were instrumental in moving plans for establishment of the Office of the Vice President for Research from rhetoric to reality. The Administration recognized that "proper faculty consultation" (Springer to Travelstead, January 12, 1968) was an essential ingredient in structurally reorganizing the institution and in developing research policy. Formal provision was

made for the faculty to

> share in the formation of policy for research and in decision making concerning research carried out at the University. It was not felt that he (the Vice President for Research) should individually or unilaterally set such policy himself, but yet could and would be responsible for policing policies adopted (Summary of Discussion on Responsibilities of the Vice President for Research," UNM, August 12, 1968, p. 5).

Establishing the Office of the Vice President for Research was frought with some difficulty in so far as the University was "young" and the issue of research hadn't been addressed as well as it had in more mature institutions. However, both experience and support for moving the University towards a graduate research institution was provided by Dr. Heady, the Academic Vice President and President-elect. "He came from a powerful and great institution, the University of Michigan, where he had been for twenty years...and before he went into office as President he took this step as an effort to give direction and emphasis to something (research) that he thought was important for an institution that hopes to be a great university (personal interview, Travelstead, July 26, 1982).

The implications of establishing the Office of the Vice President for Research included symbolically recognizing the importance of research, on and off campus. Dr. Heady noted that "the motivation was that if we organized properly and staffed up properly and got the word out throughout the University... (the) result may be that we could obtain a larger share of whatever research support may be available" (personal interview, Heady, July 19, 1982).

There was, however, a shared concern among some faculty members

and individual administrators that the University "didn't have the machinery in place so that grant requests could be processed expeditiously and track could be kept of research funds as they were being spent, what overhead was generated and what happened to it" (personal interview, Heady, July 19, 1982).

The data indicate that several key University administrators were aware of the need of the institution to "formulate campus research policies and operating principles (as well as provide) central information and logistical support--functions for grant applications" (Springer to Heady, March 11, 1968).

The Office of Research and Fellowship Services, established in 1967, was an early effort to get the University's research management "machinery" in place. It was an organizational sub-unit intended to provide support services to faculty researchers and to provide grant and fellowship services to the institution. However, Dr. Springer observed that the Office provided "inadequate informational and logistical support" (Springer to Heady, March 11, 1968) to faculty researchers. Discussions concerning the establishment of the Office of the Vice President for Research during the formative, 1967-1969, period focused on the need to "beef up" the Office of Research and Fellowship Services as well as to institute other administrative procedures that would complement the work of that office in monitoring individual faculty research proposals" (personal interview, Heady, July 19, 1982).

During this early period, several important factors contributed to the favorable disposition of members of the faculty and Administration towards the establishment of the Office of the Vice President

for Research. These were: (1) the need to reduce the workload of the Academic Vice President, (2) the need to have a Vice President who could concentrate on promoting and facilitating campus research, (3) the need to develop support services to encourage and facilitate faculty research, (4) the need to establish an internal administrative proposal review mechanism to insure that the institution could provide services for which it was being committed, and (5) the need to utilize research as an index for evaluating the University's research development efforts.

The Development of the Office of the Vice President for Research

The data indicate that between March and August 1968, the duties and responsibilities of the Vice President for Research were discussed and a tentative job description for the Office was formulated.

The definition of the duties and responsibilities for the Office of Research which was combined with the position of Dean of the Graduate School involved both creating a new office and separating functions previously handled by the Academic Vice President. Two principal considerations were addressed: (1) better consideration and more effective coordination of research activities, and (2) alleviation of the rather unwieldly workload carried by the Office of the Academic Vice President. Dr. Travelstead noted that "the position of the Vice President for Research is justified only if it facilitates, expedites and helps to improve policies, procedures and other aspects of research" (Travelstead to Adams, June 17, 1968). In analyzing the Office of the Vice President for Research and Dean of the Graduate School as it developed between 1968-1972, the

functions were broken down into six principle areas: (1) informational, (2) representational, (3) managerial, (4) developmental, (5) financing research administration, and (6) research policy. These principal functions were key elements in developing a concerted effort to support research and move the institution in the direction of a graduate research institution.

In the Summer of 1972, Dr. George Springer, the first Vice President for Research and Dean of the Graduate School, died. Finding a replacement for Dr. Springer presented the institution with both a challenge and an opportunity. At this juncture in the development of expanded research activities, there was a consensus among faculty and the administration that the research climate on campus could be improved if an experienced researcher knowledgeable about the institution, the "outside," and capable of playing a major leadership role were appointed.

Dr. Paul Silverman was appointed Vice President for Research in 1973 and was given more of an opportunity by President Heady "to devote more time to encouraging research and development...establishing relationships both within the campus...and going out and selling the potential of the institution not only at the federal scene" (personal interview, Silverman, March 24, 1982) but at the the state level as well. As a result of having this support, Dr. Silverman initiated vigorous efforts to restructure and focus the activities of the Office, set up procedures and established an important climate of support for research on campus.

Several key people in the University's central administration supported the institution's shift from an undergraduate teaching

institution towards a graduate research university. The data indicate that the administration successfully pursued two significant avenues of support for faculty research: advocating to the New Mexico State Legislature that (1) the University retain a portion of the overhead charged to grants and contracts, which had been credited to the institution's general budget, and (2) reduction in teaching loads be granted to selected faculty members engaged in research. The Administration recognized that research activities needed to be supported through the redistribution of overhead funds which served both to continue support in generating departments and to serve as seed money to potentially productive departments. These funds were considered an essential ingredient in encouraging, promoting and supporting research on campus. In addition, while faculty members were encouraged to pursue research more aggressively, the Administration realized that it also had to selectively provide research faculty with more time to conduct research. The conduct of research and scholarly publication became an important part of promotion and tenure decisions and as such underscored the Administration's need to become an effective advocate for increased resources and time for researchers. The Administration was successful in getting the Legislature to increase the percentage of overhead funds retained to support research from 50% to 80% and to reduce teaching loads of research faculty.

Development of the Office of Research and Fellowship Services as a Research Support Unit

As an outgrowth of his restructuring efforts, the role of the Office of Research and Fellowship Services, which reported to the

Vice President for Research, became more active in encouraging research. The functions of this support unit included: (1) providing informational services on research opportunities, (2) establishing a data bank on research, (3) publishing Research Notes , a bulletin listing research proposal deadlines, new contracts and grants awarded and completed, (4) maintaining a central inventory of proposals, grants and contracts on campus, (5) conducting proposal preparation and research activity seminars, and (6) identifying shifts in federal funding policy. Collectively, these functions were intended to provide a support "service-function" (personal interview, Perovich, July 26, 1982) to both faculty and Administration through the Office of the Vice President and Dean of the Graduate School. The Office of Research and Fellowship Services moved from being a rather low key, custodial administrative unit to actively promoting and encouraging research.

Edmund B. Kasner became the Director of the Office of Research and Fellowship Services in 1970 and made significant contributions to the transition. He focused on establishing rapport with the faculty and gaining their confidence through actively promoting research and providing faculty support services. The result was that the number of proposals submitted by faculty members "started to jump almost immediately" (personal interview, Kasner, May 20, 1982). There was a qualitative shift in the services provided. The data further indicate that a substantial increase in the number of proposals that were submitted and that were funded increased dramatically even though funding for research was "very tight." The ability of the new organizational structure to focus its efforts proved

successful.

The federal government was accurately viewed by the University as the major source of research support and was the principal focus of the institution's initiatives in aggressively pursuing research dollars. Dr. Silverman and Mr. Kasner, as part of the new research-development program, began to increase the visibility of the University's research potential by increasing contacts with administrators in federal agencies and among members of the State's congressional delegation.

To a lesser extent, because of the limited availability of research funds, Kasner also initiated and maintained similar contacts with members of the New Mexico State Legislature and state agencies. The data indicate that the purpose of this activity was to generate information in support of faculty research as well as to represent the capabilities and image of the University as a research institution.

After the 1973 Arab oil embargo, interest in energy-resource development increased substantially in New Mexico. The University participated in an intra-state research development plan to apply the research development plan to apply the research capabilities of New Mexico universities to the national energy crisis. According to Silverman,

> We convinced (Governor) Apodaca, at that time, to use some of the severance tax money to set up our own state (research) capacity so we could build up our (university)...in a way that would increase our visibility. We provided information, we provided programmatic goals that were politically useful and...meaningful. When we (received) federal funds for (research), we made sure that the political represen-

tatives and others were well-aware of what we were trying to do. It was a matter of communication and information (personal interview, Silverman, March 24, 1982).

During 1972-1975, when the University was establishing itself as a more aggressive research institution, it began to affiliate itself informally with other Rocky Mountain and High Plains universities that shared common research interests. This group, the Intermountain University Research Administrators (IMURA) cooperated on a number of programs designed to share research information and to strengthen their respective positions in competing for research support.

By 1974, Dr. Heady's goal of obtaining increased research funding for the University from outside sources began to be realized. During the 1972-1975 period, when federal funds for university research became relatively static, the institution began to move more aggressively in developing its research capabilities. "(W)hen a lot of (universities in the nation) were retrenching, the University of New Mexico was going externally, it as in a marketing...entrepreneurial mode" (personal interview, Kasner, May 20, 1982). The data support this impression. For example, the number of proposals submitted by faculty increased 46% between June 1971-June 1975, from 284 proposals to 613 proposals. The University's expenditure of research, development, and demonstration funds, during this period, increased (in constant 1972 dollars) nearly 25% from $7.7 million to $9.6 million. In 1972, for the first time, the University was listed (54th) by the National Science Foundation in its "Total Federal Obligations to 100 Universities and Colleges Receiving the Largest Amounts, FY 1972." The University remained on that listing through-

out the remaining period studied.

The reorganization of the institution's structure facilitated a more concerted focusing of research acquisition efforts and organizational support mechanisms for faculty. These efforts provided a "mechanism" for more effectively promoting and pursuing research support and set the stage for the institution's development efforts that followed. The data indicate that between 1968 and 1978 the number of research proposals submitted increased 382% from 270 to 1,032 and expenditures of RD&D funds increased (in 1972 constant dollars) 185% from $6.5 to $12 million dollars.

Analysis

A review of the pertinent general literature suggests that modern complex organizations are social products that are shaped by their environment. They have each developed differentiated structures for coordinating work to achieve specified ends (Blau and Scott, 1962; Blau and Schoenherr, 1971; Katz and Kahn, 1978; Meyer and Rowan, 1978; Thompson, 1967). The structure of an organization is influenced, in part, by powerful historical and environmental forces (Meyer and Rowan, 1978). Organizational survival requires adaptive as well as directive action in those strategic areas (Barnard, 1938) where the organization has discretion (Macauley, 1963; Thompson, 1967). As environments change, the organization must change the configuration of its structure in such a way that interaction with other elements will result in a viable coalignment between the organization and the environment (Blau and Scott, 1962). The structure of an organization reflects its environment, serves as a feedback mechanism through which it can influence its environment

(Blau and Scott, 1962), and creates a powerful dynamic for organizational growth (Katz and Kahn, 1978).

A more specific review of the literature suggests that organizations are affected ultimately by their environments (Thompson, 1967) and that changes in the environment will signal, with varying degrees of rapidity and magnitude, the emergence of changes in the organization (Blau and Scott, 1962; Blau and Schoenherr, 1971; Katz and Kahn, 1978; Meyer, 1978; Thompson, 1967). The adaptive function of an organization is directed towards the survival of the organization and moves in the direction of establishing equilibrium within its environment (Katz and Kahn, 1978; Meyer, 1978; Thompson, 1967).

Structural reorganization emerges from a newly-perceived demand in the environment and is patterned according to historical precedent (Meyer, 1978). The core technologies used in the organization (Thompson, 1967) are legitimated by the environment (Blau and Scott, 1962; Blau and Schoenherr, 1971; Ouchi and Jaeger, 1978; Pfeffer, 1978) and generally speed the processes by which organizations accommodate to environmental pressures (Meyer, 1978). As the environment shifts and becomes more complex, organizations adapt by developing more complex, specialized structures (Blau and Schoenherr, 1971; Katz and Kahn, 1978). Organizations are divided into subsystems that are focused on specific segments of the institution's environment (Katz and Kahn, 1978).

Generally, the faculty members and administrators who advocated the expansion of research and development activities on campus also advocated the establishment of a new office to respond to these

demands. Subsequently, in 1968 the Office of the Vice President for Research and Graduate Affairs was established--a clear indication that the University perceived a radical shift in its external environment and had moved to adapt to that shift by reorganizing its internal structure. The creation of the Office of the Vice President for Research increased the specificity and complexity of the organizational structure. This office, in combination with the Office of Research Administration and Fellowship Services, enabled the University administrators to focus on the institution's research efforts. The area of scholarly research and publication was a legitimate activity for faculty, but one which had not been supported as it had in more mature institutions, according to Dr. Chester Travelstead. In addition, the historical precedent of having Vice Presidents for Research in established universities contributed to the legitimacy of that office. Although the institution's research faculty supported the creation of the office, some concerns were raised over the possibility of undue administrative control of research activities and the role of faculty members in determining research policy.

The University modified its organizational structure to focus specifically on encouraging and supporting faculty research. Maintaining external contacts, gathering information, and representing the University at various state, regional, and national meetings were an important part of the rationale for establishing and operating the Office of the Vice President for Research throughout the period 1967-1978. The Vice President's participation in the Governor's Science Advisory Committee and Intermountain University

Research Administrators (IMURA), his extensive contacts with key administrators in federal funding agencies and with New Mexico's Congressional delegation seemed to increase the flow of information about the University's research funding environment. This flow of information was associated with the Vice President's developing a better understanding of the University's external environment and assisted faculty members in pursuing research support.

The data indicate that between 1971-1978 the Vice President for Research and the Director of the Office of Research Administration operated at a critical juncture between the organization and its external environment. The information acquired about the University's funding environment was associated with its development in the direction of a graduate research institution.

The data indicate that the University modified its organizational structure in part as an adaptive response to new pressures from its research support environment. The creation of the Office of the Vice President for Research increased the organizational specificity of the University and was associated with the institution's coalignment with its external research support environment. The environmentally-influenced structural reorganization of the University suggests the following propositions.

1.0 The more powerful and sustained the changes in a university's external environment, the greater the probability of internal reorganization.

1.1 The greater the degree of change in a university's external environment, the greater the pressure for internal adaptive sub-systems.

Toward a Theory of Structural Reorganization in Developing Research Universities

Zetterberg (1965) notes that to ask for an explanation of a phenomenon is to ask for a theory. The proposition suggested by the data that are related to the phenomenon of the emergence of the University of New Mexico as a graduate research institution is a review of what has been learned about structural reorganization from this unique study of a single institution. Structural reorganization is a "determinent" (Zetterberg, 1965) and its corresponding properties emerged from the data. A limited but "grounded" theoretical explanation (Glaser and Strauss, 1967) of the phenomenon of the development of the University in the direction of a graduate research university is presented as a statement that concludes the analysis and can be summarized thus:

The development of an undergraduate teaching institution in the direction of a graduate research university is partially explained as a function of the degree of effort towards and success at structural reorganization.

Significance of the Study

Organizations are social inventions that are both fluid and dynamic. They move in time and space, act and react, and are shaped by a combination of external and internal environmental factors that both threaten survival and provide impetus for modification. The manner in which environmental influences affect organizations and the adaptive mechanisms utilized by University leaders are important foci for organizational research.

This ethnohistorical study of the University of New Mexico is unique in both setting and purpose. It represents the first ethnohistorical effort to contextually examine structural reorganization as a factor associated with the development of a graduate research university at a time when federal funding for research support remained at a relatively static level. This study provides a contextually rich historical description of a variety of forces that influenced some members of the faculty and administration of the University of New Mexico to take a particular course of action that shaped the future character of the institution.

It is hoped that any conclusions drawn from this research effort will contribute to the ability of universities to understand the forces that are associated with the emergence of research institutions. At the very least, it is hoped that this study will contribute to the literature on how universities adapt to changes in their external research support enironment and the utilization of structural reorganization as a mechanism associated with the development of research universities.

The value of qualitative research rests in the discovery of new understandings and insights into the development of grounded theory. Although this paper does not assert that the grounded theory developed here will reflect the manner in which all institutions adapt to external changes and develop in the direction of graduate research institutions; however, it does advance the premise that understanding the response of one institution may contribute to both fundamental and general understandings of how similar universities respond to similar changes and needs in their environments. Although the propo-

sitions developed here are contextually limited to this study, they have raised questions for further research into this phenomenon.

BIBLIOGRAPHY

Ashworth, K. H. Scholars and Statesmen: Higher Education and Government Policy . San Francisco: Jossey-Bass, 1972.

Babbidge, D., Jr. "Reviews from the Campus." In H. Orlans', Science Policy and the University . Washington, D.C.: The Brookings Institution, 1968.

Babbie, E. R. The Practice of Social Research (2nd ed.). Belmont, MA: Wadsworth Publishing Company, 1979.

Baldridge, J. V., and Deal, T. E. Managing Change in Educational Organizations: Sociological Perspectives, Strategies and Case Studies . Berkeley: McCutchan, 1975.

Barnard, C. I. The Function of the Executive . Cambridge, MA: Harvard University Press, 1938.

Ben-David, J. American Higher Education: Direction Old and New . New York: McGraw-Hill, 1972.

Bjork, L. G. Organizational Environment and the Development of a Research University . Doctoral Dissertation, ERIC, 1983.

Blase, J. "A Social-Psychological Grounded Theory of Teacher Stress and Burnout." Educational Administration Quarterly , 1982, 18 , 93-113.

Blau, P. M. and Schoenherr, R. A. The Structure of Organizations . New York: Basic Books, 1971.

Blau, P. M. and Scott, R. W. Formal Organizations: A Comparative Approach . San Francisco: Chandler Publishing, 1961.

Corson, J. J. The Governance of Colleges and Universities . New York: McGraw-Hill, 1975.

Cronbach, L. V., and Suppes, P. (Eds.). Research for Tomorrow's Schools . New York: Macmillan, 1969.

Dupree, A. H. Science in the Federal Government: A History of Policies and Activities to 1940 . Cambridge, MA: The Belnap Press of Harvard University Press, 1957.

Emery, R. E., and Trist, E. "The Causal Texture of Organizational Environment." Human Relations , 1965, 18 , 21-31.

Filstead, W. J. "Qualitative Methods: A Needed Perspective in Evaluation Research." In T. D. Cook and C. S. Reichardt (Eds.), Qualitative and Quantitative Methods in Evaluation Research . Beverly Hills: Sage, 1979.

Fioke, C. R. Factors Contributing to Shifting Governance and Control of

Independent Colleges: An Analysis of Church Related Institutions in New Mexico . Unpublished doctoral dissertation, University of New Mexico, 1981.

Giacquinta, J. G. "The Process of Organizational Change in Schools." In F. N. Kerlinger (Ed.), Review of Research in Education (Vol. 1). Itasca: F. G. Peacock, 1973.

Gladieux, L. E. Congress and the Colleges: The National Politics of Higher Education . Lexington, MA: Lexington Books, 1976.

Glaser, B. G., and Strauss, A. The Discovery of Grounded Theory . Chicago: Aldine-Atherton, 1967.

Greely, A. The Changing Catholic College . Chicago: Aldine Publishing, 1967.

Gross, E., and Brambsch, P. Changes in University Organization , 1946-1971. New York: McGraw-Hill, 1974.

Handler, P. "Science and Government: Opportunities and Conflicts." In F. Seitz (Ed.), Science, Government and the Universities . Seattle: University of Washington Press, 1966.

Heimovicks, R. D. "Federal Support of University Research and Development." In T. P. Murphy (Ed.), Science, Geopolitics and Federal Spending . Lexington, KY: Heath Lexington Books, 1971.

Herriott, R. E., and Gross, N. (Eds.), The Dynamics of Planned Educational Changes: Case Studies and Analyses . Berkeley: McCutcheon, 1979.

Higbie, V. F. Determinants of Institutionalization of Innovation in Higher Education . Unpublished doctoral dissertation, University of New Mexico, 1981.

Hornig, D. A. "Look Ahead." In F. Seitz (Ed.), Science, Government and the Universities . Seattle: University of Washington Press, 1966.

Iannacco[illegible] L. "The Field Study in Educational Policy Research." Education and Urban Society , 1975, 17 , 220-245.

Katz, D., and Kahn, R. L. The Social Psychology of Organization (2nd ed.).
New York: John Wiley and Sons, 1978.

Kidd, C. V. American Universities and Federal Research . Cambridge, MA: The Belnap Press of the Harvard University Press, 1959.

Klopsteg, P. E. "Support of Basic Research from Government." In D. Wolfle (Ed.), Symposium on Basic Research . Washington, D.C.: American Association for the Advancement of Science, 1959.

Levine, A. Why Innovation Fails: The Institutionalization and Termination of Innovation in Higher Education . Albany, NY: State University of New York Press, 1980.

Lofland, J. Analyzing Social Settings . Belmont, MA: Wadsworth Publishing, 1971.

Macauley, S. "Non-Contractual Relations in Business: A Preliminary Study." American Sociological Review , February 1963, 28 , 55-67.

March, J. G., and Olsen, J. P. Ambiguity and Choice in Organizations . Bergen, Norway: Universitetofortaget, 1976.

Martorana, S. V., and Kuhns, E. Managing Academic Change: Interactive Forces and Leadership in Higher Education . San Francisco: Jossey-Bass, 1975.

McCall, G. J., and Simmons, J. L. (Eds.), Issues in Participant Observation: A Text and Reader . Reading, MA: Addison-Wesley Publishing, 1969.

Merton, R. K. Social Theory and Social Structure . New York: The Free Press, 1957.

Meyer, J. W., and Rowan, B. "The Structure of Educational Organizations."
In M. W. Meyer (Ed.) Environments and Organizations . San Francisco: Jossey-Bass, 1978.

Miles, M. B. Innovation in Education . New York: Teachers College Press, Columbia University, 1964.

Millet, J. D. Financing Higher Education . New York: Columbia University Press, 1952.

Murphy, T. P. Science, Geopolitics and Federal Spending . Lexington, KY: Heath Lexington Books, 1971.

Nagi, S. Z., and Corwin, R. G. The Social Contexts of Research . New York: Wiley-Interscience, 1972.

Orlans, H. (Ed.). Science: Policy and the University . Washington, D.C.: The Brookings Institution, 1968.

Ouchig, R. N., and Jaeger, A. M. "Social Structure and Organizational Type."
In M. W. Meyer (Ed.), Environments and Organizations . San Franisco: Jossey-
Bass, 1978.

Pace, C. R. The Demise of Diversity . Berkeley: Carnegie Foundation for the Advancement of Teaching, 1974.

Paltridge, J., Hurst, J., and Morgan, A. Boards of Trustees: Their Decision Patterns . Berkeley: Center for Research and Development in Higher Education, University of California, 1973.

Pfeffer, J. "The Micropolitics of Organizations." In M. W. Meyer (Ed.), Environments and Organizations . San Francisco: Jossey-Bass, 1978.

Polyani, M. *The Study of Man*. London: Routledge and Kegan Paul, 1958.

Price, D. K. *The Scientific Estate*. Cambridge, MA: The Belnap Press of Harvard University Press, 1965.

Rist, R. C. *On Qualitative Research Issues of Design, Implementation, Analysis, Ethics, Applicability*. Unpublished paper, New York, March 1982.

Rivilin, A. M. *The Role of the Federal Government in Financing Higher Education*. Washington, D.C.: The Brookings Institution, 1961.

Schumacher, S. *Ethnohistorical Research: A Comparison of Two Qualitative Approaches to Inquiry*. St. Louis: Washington University, 1972 (mimeographed).

Seitz, F. (Ed.). *Science, Government and the Universities*. Seattle: University of Washington Press, 1966.

Smith, B. L., and Karlesky, J. *The State of Academic Science: The Universities in the Nation's Research Effort*. New York: Change Magazine Press, 1977.

Smith, L. M., and Keith, P. M. *Anatomy of Educational Innovation: The Organizational Analysis of an Elementary School*. New York: John Wiley and Sons, 1971.

Smith, L. M., and Pohland, P. A. *Education, Technology, and the Rural Highlands*. AERA Evaluation Monograph Series (Vol. 8). Chicago: Rand McNally, 1972.

Stake, R. "The Case Study Method in Social Inquiry." *Educational Researcher*, 1978, *7*, 6-9.

Stewart, C., and Cash, W. *Interviewing: Principles and Practices*. Dubuque, IA: Wm. C. Brown Publishers, 1974.

Strickland, S. (Ed.). *Sponsored Research on American Universities and Colleges*. Washington, D.C.: American Council on Education, 1967.

Thompson, J. D. *Organization in Action*. New York: McGraw-Hill, 1967.

U.S. Government, Energy Research and Development Administration. *National Plan for Energy Research, Development and Demonstration: ERDA 48*. Washington, D.C.: U.S. Government Printing Office, 1975.

Veysey, L. R. *The Emergence of the American University*. Chicago: University of Chicago Press, 1965.

Wolfle, E. (Ed.). *Symposium on Basic Research*. Washington, D.C.: American
Association for the Advancement of Science, 1959.

Zetterberg, H. L. *On Theory and Verification in Sociology* (3rd ed.).

Totowa, NJ: The Bedminster Press, 1965.